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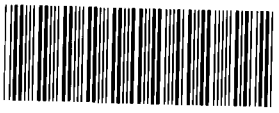
established 1959

January 24, 1995
2510-95/11



Ms. Laurie Peterson-Wright
EG&G Rocky Flats, Inc.
P.O. Box 464, Bldg. 080
Golden, Colorado 80402-0464

Subject: Submittal of January 18, 1995 Meeting Minutes
Technical Working Group Meeting for Operable Unit No. 7
(MTS Contract 353017TB3)

Dear Ms. Peterson-Wright:

Enclosed are meeting minutes to document the January 18, 1995, technical working group meeting for the OU 7 seep collection and landfill closure interim measure/interim remedial actions.

If you have any questions, please contact me at your convenience.

Sincerely,

Myra K. Vaag
Project Manager

Enclosure

cc:	W. Bartholomew w/o	EG&G	B. Caruso	Stoller
	L. Brooks	EG&G	A. Crockett	Stoller
	R. Cygnarowicz	EG&G	M. Eisenbeis	Stoller
	T. Lindsay	EG&G	S. Franklin	Stoller
	P. Martin	EG&G	C. Gee	Stoller
	P. Corser	TerraMatrix	J. Jankousky	Stoller
	J. Kendall	TerraMatrix	D. Palmer	Stoller
			L. Ross w/o	Stoller
			B. Stephanus w/o	Stoller
			MKV Chron w/o	Stoller
			B. Stephanus w/o	Stoller
			OU7 Project File	

1/19

The S.M. Stoller Corporation 5700 Flatiron Parkway Boulder, Colorado 80301-5718 303-449-7220 FAX 303-443-1408

Minutes for the OU 7 Seep Collection/Landfill Closure IM/IRA
Technical Working Group Meeting
January 18, 1995

DOE announced that there would be a new OU 7 project manager for DOE next week; Peg Witherill. Stoller distributed handouts summarizing the development of alternatives and presenting pros and cons of the four preferred alternatives. The following topics were discussed:

Landfill Closure IM/IRA

Technology Literature Research - Under the presumptive remedy approach, technologies for capping, disposition of soils and sediments, groundwater control, groundwater collection, and groundwater treatment were identified in the Technology Literature Research report. The technologies were grouped into alternatives for evaluation during the options analysis.

Options Analysis - Options were eliminated from further consideration as a result of EG&G/DOE guidance, comparative analysis, groundwater modeling, and HELP modeling. It was assumed that groundwater would be treated at an existing onsite facility as a result of guidance from EG&G/DOE. The French drain option was eliminated based on a comparative analysis of a slurry wall and a French drain for groundwater control. The collection well option for downgradient groundwater collection was eliminated based on the results of a comparative analysis of collection wells and a French drain. Several additional options were eliminated as a result of groundwater modeling. Based on the results of the CDPHE screen, low levels of arsenic contamination are present in soils and all soils must be addressed in the remedial action. This could change as a result of the dispute resolution for similar low levels of arsenic contamination at OU 3.

Alternatives Development - Fifteen alternatives were developed by adding options for disposition of soils and sediments to scenarios considered viable based on the results of the groundwater modeling.

Initial Screening - Conceptual capital costs were developed for each alternative. Options that involved covering, treating, or disposing of soils and sediments offsite were significantly more expensive than options that involved consolidating soils and sediments under the cap and were eliminated.

Detailed Analysis - Four alternatives (1a, 2a, 2d, 5a-mod) were retained for detailed analysis. Conceptual present worth costs of each of these alternatives is essentially the same. Alternatives 1a, 2a, and 2d score highest in terms of effectiveness. Alternatives 1a and 2a score highest in terms of implementability. Alternative 5a scores highest in terms of environmental impact because of the reduced volume of fill required.

A slurry wall is included in all alternatives. The permeability of the slurry wall was decreased from 10^{-6} to 10^{-7} cm/sec because the model showed that particles were moving through the wall. TerraMatrix suggested that a membrane could be added to the slurry wall to further reduce permeability but would double the cost of construction. Stoller will model this scenario to see if groundwater would surface west of the landfill due to increased heads. If so, pumping wells or a French drain may be necessary to divert groundwater around the landfill. Stoller and TerraMatrix suggested making the slurry wall deeper in the vicinity of the fault. DOE asked if the slurry wall is even needed. Stoller will model one alternative without the slurry wall to see what happens.

For Alternative 1a, DOE proposed constructing a wetlands above the dam near the existing East Landfill Pond to remediate organic compounds. Constructed wetlands may or may not be considered adequate for mitigation. All alternatives must mitigate loss of wetlands and endangered species habitat.

A GCL was added to Alternative 5a to address increased infiltration through the cap as a result of the swale design. The swale design will cause stress on the liner and increase the potential for infiltration. Stoller and TerraMatrix reiterated that there are lots of uncertainties with this alternative. TerraMatrix is conducting a cost sensitivity analysis of this alternative.

Stoller will prepare a decision matrix for the meeting next week to help evaluate the alternatives. The matrix may also be used for the agency meeting. DOE will decide whether to present the preferred alternative or all four alternatives to CDPHE and EPA.

Operation and Maintenance Costs - DOE is reviewing the RTG report for DOE/PME summarizing the cost analysis of onsite versus offsite treatment. Treatment costs for inclusion in the Landfill Closure IM/IRA decision document should be available by next week. Rough estimates are $0.25/gallon to haul the seep water and $0.40 to treat it.

Agency Meeting

The next agency meeting will be at 1:00 p.m. on February 2, 1995, at the EPA conference center. DOE will present the preferred alternative for the landfill closure IM/IRA decision document and will be prepared to discuss other alternatives, or will present all four alternatives to CDPHE and EPA. Stoller and TerraMatrix will be available to answer questions about the cover section and the cap. EG&G will present the preferred treatment alternative for the OU 7 seep water.

DOE suggested that Stoller/TerraMatrix be prepared to answer questions about the reasons for the differences between cap designs for OU 7 and OU 4 and to explain how information from other DOE sites was used in the options analysis. In addition, EPA may have questions about how to evaluate the effectiveness of the slurry wall. DOE also suggested preparing a decision matrix to show the pros and cons of the final alternatives (1a, 2a, 2d, and 5a). The matrix should include natural resource damage, habitat mitigation, risk, public perception, and uncertainty. Costs could be presented with a distribution rather than as discrete costs.

Action Items

The formal meeting minutes are the forum for tracking action items. A list of the action item, the person responsible for the action, and the status of the action item is included below. The list will be updated weekly. When an action has been completed, it will be stated as such, and the item will be removed from the action item list the following week.

01-121	Completed.
122	Determine possible trucking route from Western Aggregates to the present landfill east of Colorado Highway 93 (T. Lindsay, EG&G). EG&G is investigating options for a trucking route including improving existing roads or constructing new roads in the buffer zone between Western Aggregates and OU 5 and OU 7. In progress.
123-149	Completed.
150	Obtain information regarding cover designs for Lowry Landfill, Marshall Landfill, and RMA (T. Lindsay, EG&G). EG&G provided Stoller with information on cover designs from Hanford and Los Alamos. In progress.

151-157 Completed.

158 Determine allowable activities for radiological contaminants in soils/sediments (L. Peterson-Wright, EG&G). The no-rad-added policy is being reconsidered based on the reorganization of the cognizant professionals. In progress.

159-162 Completed.

163 Obtain a value for ground acceleration and information on the frequency of earthquake events from the Seismic Investigation Program for use in the stability analysis at OU 7 and OU 5 (L. Peterson-Wright, EG&G). EG&G provided Stoller with a copy of the Seismic Investigation Program report on January 18. Stoller will make copies and return to EG&G. Completed.

164 Determine if Claymax has been approved by EPA Region VIII for cap designs at other sites (P. Pigeon, DOE/PME). This action item is no longer applicable. Completed.

165-166 Completed.

167 Follow up on the sample of seep water collected for TOC analysis (P. Pigeon, DOE/PME).

168-169 Completed.

170 Transfer Phase II field equipment from Stoller to EG&G (S. Lynn, Stoller, and L. Peterson-Wright, EG&G). The water in the purge tank was disposed on January 13. Field equipment was transferred to EG&G on January 17. Completed.

171 Determine the location of radionuclides in soils and groundwater within the landfill to see if capping option 5 will encounter radionuclides when cutting waste material (J. Jankousky, Stoller). Radionuclides are present in groundwater/leachate within the landfill where cutting of the waste material is proposed. The presence of radionuclides may pose a health and safety problem during excavation. Completed.

172 Brainstorm how the inferred fault near OU 7 will affect the movement of groundwater and the cap and slurry wall design (M. Vaag, Stoller). In progress.

173 Investigate the nature of contamination, if any, in the LHSU downgradient of the landfill using analytical results from well 53094 (J. Jankousky, Stoller). In progress.

174 Provide Stoller with O&M costs for groundwater treatment at the existing OU 1 facility (P. Pigeon, DOE/PME, and L. Peterson-Wright, EG&G).

175 Provide Stoller and TerraMatrix with the Rocky Flats standard interest rate, contingency percentage, and escalation (T. Lindsay and L. Peterson-Wright, EG&G). EG&G provided Stoller with a contingency percentage. In progress.

176 Completed.

177 Investigate why the existing slurry wall at OU 7 is not functioning properly, and compile information regarding the success/failure rate of other slurry walls (P. Corser, TerraMatrix). In progress.

178 Determine how to evaluate the performance of the new slurry wall after it is in place (J. Jankousky, Stoller, and P. Corser, TerraMatrix). A rigorous quality assurance program could be implemented during construction to ensure that permeability of the slurry wall meets technical specifications. The problem encountered most frequently during construction is when the side slabs off; however, this problem occurs primarily in sandy and gravely soils, not in clayey soils like those at OU 7. Completed.

179 Reduce the permeability of the slurry wall and use the existing groundwater model to determine if a French drain or pumping wells are necessary upgradient of the slurry wall to prevent the groundwater from surfacing west of the landfill (J. Jankousky, Stoller).

180 Research basis for the 1000-year cap design at OU 4, and be prepared to show why a 1000-year cap is not needed at OU 7 (M. Vaag, Stoller, and P. Corser, TerraMatrix).

181 Brief new DOE OU 7 project manager (Peg Witherill) on the location and descriptions of IHSSs, the regulatory history of the site, the history of disposal and spray evaporation, and the nature and extent of contamination at the site (L. Peterson-Wright, EG&G).

182 Provide Stoller with a copy of the decision matrix for capping options from OU 5 (L. Peterson-Wright, EG&G).

Next Meeting

The next meeting will be at 10:00 a.m. on January 25, 1995, in the EG&G large west conference room.

List of Attendees

Name	Organization	Phone
Pat Corser	TerraMatrix	(303) 879-6260
Mary Eisenbeis	Stoller	546-4474
John Jankousky	Stoller	546-4412
John Kendall	TerraMatrix	763-5140
Tom Lindsay	EG&G	966-6985
Peter Martin	EG&G	966-8695
Kurt Muenchow	DOE	966-2184
Laurie Peterson-Wright	EG&G Project Manager	966-8553
Paul Pigeon	RTG/DOE/PME	966-5611
Myra Vaag	Stoller Project Manager	546-4417

Alternatives Development
Summary

I. Technology Literature Research - Presumptive Remedy Approach (Attachment 1)

II. Elimination of Options

A. EG&G/DOE input
- Assume all soils/sediments must be addressed, not just IHSSs
- Assume groundwater treatment at existing onsite facility

B. Comparative Analysis
- Groundwater Containment: Slurry Wall vs. Drain
- Groundwater Collection: Wells vs. Drain

C. Groundwater Modeling

Scenarios which combined the four capping options with dam removal, groundwater containment and groundwater collection options were modeled.

Results:

- If the dam is left in place, groundwater must be collected above the dam to avoid saturating the landfill to the bottom of the cap. Eliminate 2 scenarios.
- If the dam is removed and the slurry wall encompasses the landfill groundwater must be collected within the wall to avoid saturating the landfill to the bottom of the cap. Eliminate 2 scenarios.
- There does not appear to be any significant difference in the effectiveness of capturing contaminated particles. Groundwater collection ranged from 0.77 to 1.24 gpm. However, higher flows indicate a slightly faster drainage rate.

III. Alternative Development

Fifteen alternatives (Attachment 2) were developed by adding soils/sediments options to scenarios considered viable based on the groundwater modeling.

IV. Initial Screening

Conceptual capital costs were developed for each alternative.

- Options involving covering, treatment or off-site disposal of soils/sediments were significantly more expensive than consolidating the soils/sediments (Attachment 3). Eliminate.
- Five alternatives were retained for Detailed Analysis (Attachment 4).

V. Detailed Analysis

A. Refinement of Alternatives

- Modeling showed a high number of particles moving through the slurry wall, so the permeability of the slurry wall was decreased from 10^{-6} to 10^{-7} cm/sec.
- Option 5 was revised to include an additional layer to address increased infiltration through the cap due to the swale design.

B. Effectiveness, Implementability, Cost and Environmental Impact (Attachment 5)

Effectiveness: Alternative 5a (modified) is ranked lowest because the proposed slopes of 2 to 3% are less than EPA guidelines which may increase the potential for infiltration of water although an additional layer was added to the cap to address this problem. Alternative 5a (modified) places the FML in tension as the landfill waste and fill settle. This circumstance will increase the stress on the FML seams. The effect of this additional stress is uncertain.

Implementability: Alternative 2d scores a negative in terms of implementability because the french drain located above the dam would be under the cap, requiring a manhole approximately 50 feet deep and an unnecessary penetration of the cap. Alternative 5a (modified) scores lower than the others for implementability because of the following: (1) potential negative public perception due to uncovering and moving potentially radioactive and hazardous waste, (2) requirement that regulators accept cap that does not meet EPA guidelines, and (3) increased O & M requirements due to flatter slopes

Cost: The modified Alternative 5a (modified), Alternative 2a, and Alternative 1a are for all practical purposes identical in present worth cost. Alternative 2d is slightly higher. Given the level of development of the designs and the cost estimates, cost should not be a deciding factor for these options.

	Capital Cost	O&M Cost	PresentWorth
Alternative 5a (mod)	$9,393,800	$2,774,400	$12,168,200
Alternative 2a	$9,843,500	$2,488,600	$12,332,100
Alternative 1a	$9,669,100	$2,667,300	$12,336,400
Alternative 2d	$10,016,300	$2,667,300	$12,683,600

Environmental Impact: . Alternative 5a (modified) score higher because of the greatly reduced fill volume required.

C. Recommendations

Option 2d should be eliminated because of the requirement for a 50 feet deep manhole.

The decision between the remainder is not obvious. Alternative 1a is somewhat more complex than Alternative 2a. Alternative 5a requires less fill, but has more negatives associated with it than the others.

Attachment 1

OU 7 Landfill Closure
Sitewide Options based on Presumptive Remedy

Capping	Soils and Sediments	Containment	GW Collection	GW Treatment
Location	**Method**	**Method**	**Method**	**Method**
Cover Landfill Footprin	Cover	Slurry Wall (Permeability)	Wells	New OU 7 facility
Cover to Dam	Consolidate	Drain	Drain	Existing onsite facility
	Excavate and Treat			
Dam	Excavate and Dispose	**Location**	**Location**	
Leave Dam in place		Stops West of Dam	Above Dam	
Remove Dam	**Quantity**	Extends to Dam	Below Dam	
	All S/S (12602 CY)	Encircles area	Above and Below Dam	
Cap Cross Section	IHSS Soil/Sediments (5980 CY)			
Option 1	Soil Hotspots/Sediments			
Option 2				
Option 3				

ATTACHMENT 1.

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Alternatives Development

RESULTS OF MODELING

Based on the groundwater modeling the following alternatives were developed:

Alternative 1:

- Cap the landfill **footprint**
- **Dam** left in place, with culvert for surface water flow
- **U-shaped** slurry wall stops short of dam
- Treat groundwater at OU 1/OU 2

Alternative 1a:
- Collection **above and below** dam
- **Consolidate** soils/sediments

Alternative 1b:
- Collection **above and below** dam
- **Excavate and treat** soils/sediments

Alternative 1c:
- Collection **above and below** dam
- **Excavate and dispose** soils/sediments offsite

Alternative 2:

- Cap the landfill **footprint**
- **Remove dam**
- Regrade for drainage
- Treat groundwater at OU 1/OU 2

Alternative 2a:
- Collection **below** former dam
- **U-shaped** slurry wall stops short of dam
- **Consolidate** soils/sediments

Alternative 2b:
- Collection **below** former dam
- **U-shaped** slurry wall stops short of dam
- **Excavate and treat** soils/sediments

Alternative 2c:
- Collection **below** former dam
- **U-shaped** slurry wall stops short of dam
- **Excavate and dispose** of soils/sediments offsite

Alternative 2d:
- Collection **above and below** former dam
- **Circular** slurry wall
- **Consolidate** soils/sediments

Alternative 2e:
- Collection **above and below** former dam
- **Circular** slurry wall
- **Excavate and treat** soils/sediments

Alternative 2f:
- Collection **above and below** former dam
- **Circular** slurry wall
- **Excavate and dispose** soils/sediments

Alternative 3:
- Cover the landfill, soils/sediments
- **Dam left in place**, with surface drainage through existing spillway
- **Cover soils/sediments**
- **U-shaped** slurry wall to the dam
- Treat groundwater at OU 1/OU 2

Alternative 3a:
- Collection **above and below** dam

Alternative 3b:
- Collection **below** dam

Alternative 4:
- Cover the landfill, soils/sediments
- **Cover soils/sediments**
- **Remove dam**
- Treat groundwater at OU 1/OU 2

Alternative 4a:
- Collection **below** former dam
- **U-shaped** slurry wall todam

Alternative 4b:
- Collection **above and below** former dam
- **Circular** slurry wall to former dam

Alternative 5:

- Cap the landfill footprint
- **Remove** dam
- **Regrade landfill waste** to minimize fill
- Treat groundwater at OU 1/OU 2

Alternative 5a:
- Collection **below** former dam
- **U-shaped** slurry wall stops short of dam
- **Consolidate** soils/sediments

Alternative 5b:
- Collection **below** former dam
- **U-shaped** slurry wall stops short of dam
- **Excavate and treat** soils/sediments

Alternative 5c:
- Collection **below** former dam
- **U-shaped** slurry wall stops short of dam
- **Excavate and dispose** of soils/sediments offsite

ATTACHMENT 3

OU 7 Landfill Closure

CONCEPTUAL COST ESTIMATE SUMMARY

Note: These costs are conceptual and based on available data. They should be used for comparison of alternatives only. A detailed cost estimate will be prepared after the initial screening.

Alternative 1a	$9,751,900
Alternative 1b	$22,431,800
Alternative 1c	$32,031,490
Alternative 2a	$9,926,200
Alternative 2b	$28,576,300
Alternative 2c	$32,205,790
Alternative 2d	$10,098,900
Alternative 2e	$28,749,000
Alternative 2f	$32,378,590
Alternative 3a	$15,374,500
Alternative 3b	$15,241,600
Alternative 4b	$13,586,600
Alternative 4c	$13,757,600
Alternative 5a	$8,674,900
Alternative 5b	$20,808,800
Alternative 5c	$30,408,590

In order from least expensive to most expensive:

Alternative 5a	$8,674,900
Alternative 1a	$9,751,900
Alternative 2a	$9,926,200
Alternative 2d	$10,098,900
Alternative 4b	$13,586,600
Alternative 4c	$13,757,600
Alternative 3b	$15,241,600
Alternative 3a	$15,374,500
Alternative 5b	$20,808,800
Alternative 1b	$22,431,800
Alternative 2b	$28,576,300
Alternative 2e	$28,749,000
Alternative 5c	$30,408,590
Alternative 1c	$32,031,490
Alternative 2c	$32,205,790
Alternative 2f	$32,378,590

Based on this cost analysis the following alternatives were retained for further analysis:

Alternative 5a	Alternative 2a
Alternative 1a	Alternative 2d

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Alternatives Development

RESULTS OF CONCEPTUAL COST ESTIMATE

Based on the conceptual cost estimate the following alternatives were developed:

Alternative 1a:

- Cap the landfill **footprint**
- **Dam** left in place, with culvert for surface water flow
- **U-shaped** slurry wall stops short of dam
- Treat groundwater at OU 1/OU 2
- Collection **above and below** dam
- Consolidate soils/sediments

Alternative 2a:

- Cap the landfill footprint
- **Remove dam**
- Regrade for drainage
- **U-shaped** slurry wall stops short of dam
- Treat groundwater at OU 1/OU 2
- Collection **below** former dam
- Consolidate soils/sediments

Alternative 2d:

- Cap the landfill footprint
- **Remove dam**
- Regrade for drainage
- Treat groundwater at OU 1/OU 2
- Collection **above and below** former dam
- **Circular** slurry wall
- Consolidate soils/sediments

Alternative 5a (modified):

- Cap the landfill footprint with swale down center
- **Remove dam**
- Regrade for drainage
- **U-shaped** slurry wall stops short of dam
- Treat groundwater at OU 1/OU 2
- Collection **below** former dam
- Consolidate soils/sediments

ATTACHMENT 5

Alternatives Development

COMPARATIVE ANALYSIS OF FIVE ALTERNATIVES

Alternative 1a:

- Cap the landfill **footprint**
- **Dam** left in place, with culvert for surface water flow
- **U-shaped** slurry wall stops short of dam
- **Consolidate** soils/sediments
- Treat groundwater at OU 1/OU 2
- Groundwater collection **above and below** dam

EVALUATION

Effectiveness:

⇒ Dam continues to provide a barrier.
⇒ Second collection system provides backup in case of failure.
⇒ Groundwater collection above and below dam will result in increased O&M costs.
⇒ Increase short term risks during consolidation.
⇒ Provides somewhat higher flows (0.91 gpm) to the groundwater collection system, therefore although the alternative is not more effective in the long run, it has the potential to be cleaned up in shorter period (although it may not be w/i the assumed 30 year life of project)
⇒ Grading plan provides positive drainage off cover even after settlement (5% post-settlement grades).
⇒ Placement of fill at toe of slope will facilitate buttressing the unstable slopes below the north asbestos area.
⇒ Depending on the permeability characteristics of the general fill material, an additional gas collection layer may be required.
⇒ The surface water drainage will require construction of a culvert or notch through the embankment to provide gravity flow out of the pond.

Implementability:

⇒ All aspects of the alternative are administratively feasible.
⇒ Construction will require that some surface drainage features be relocated and some new channels designed.

Cost:

⇒ Capital cost is $9,669,100.
⇒ Present Worth of O&M over 30 years is $2,667,300.
⇒ Total Present Worth cost is $12,336,400.

Environmental Impact:

⇒ The need for off-site material will result in substantial disturbance of the borrow area. Required fill volume is 224,162 CY.

Alternative 2a:

- Cap the landfill **footprint**
- **Remove dam**
- Regrade for drainage
- Treat groundwater at OU 1/OU 2
- **Consolidate** soils/sediments
- Collection **below** former dam
- **U-shaped** slurry wall stops short of dam

Effectiveness:

⇒ Increase in short term risk due to regrading.
⇒ Increase short term risks during consolidation of soils/sediments.
⇒ Grading plan provides positive drainage off cover even after settlement (5% post-settlement grades).
⇒ Placement of fill at toe of slope will facilitate buttressing the unstable slopes below the north asbestos area.
⇒ Depending on the permeability characteristics of the general fill material, an additional gas collection layer may be required.
⇒ The excavation of fill from the embankment will help to reduce the material in-balance.

Implementability:

⇒ All aspects of the alternative are administratively feasible.
⇒ Construction will require that some surface drainage features be relocated and some new channels designed.

Cost:

⇒ Capital cost is $9,843,500.
⇒ Present Worth of O&M over 30 years is $2,488,600.
⇒ Total Present Worth cost is $12,332,100.

Environmental Impact:

⇒ The need for off-site material will result in substantial disturbance of the borrow area Required fill volume is 243,480 CY.
⇒ Removal of the embankment will result in a more natural, long lasting, surface water drainage feature.

Alternative 2d:

- Cap the landfill **footprint**
- **Remove dam**
- Regrade for drainage
- Treat groundwater at OU 1/OU 2
- **Consolidate** soils/sediments
- Collection above and **below** former dam
- **Circular** slurry wall

Effectiveness:

⇒ Increase in short term risk due to regrading.
⇒ Second collection system provides backup in case of failure.
⇒ Groundwater collection above and below dam will result in increased O&M costs.
⇒ Increase short term risks during consolidation.
⇒ Grading plan provides positive drainage off cover even after settlement (5% post-settlement grades).
⇒ Placement of fill at toe of slope will facilitate buttressing the unstable slopes below the north asbestos area.
⇒ Depending on the permeability characteristics of the general fill material, an additional gas collection layer may be required.
⇒ The excavation of fill from the embankment will help to reduce the material in-balance.

Implementability:

⇒ All aspects of the alternative are administratively feasible.
⇒ Construction will require that some surface drainage features be relocated and some new channels designed.

Cost:

⇒ Capital cost is $10,016,300.
⇒ Present Worth of O&M over 30 years is $2,667,300.
⇒ Total Present Worth cost is $12,683,600.

Environmental Impact:

⇒ The need for off-site material will result in substantial disturbance of borrow area. Required fill volume is 243,480 CY.
⇒ Removal of the embankment will result in a more natural, long lasting, surface water drainage feature.

Alternative 5a (modified):

- Cover the landfill footprint
- **Remove dam**
- **Consolidate** soils/sediments
- **U-shaped slurry** wall to dam
- Treat groundwater at OU 1/OU 2
- Collection **below** former dam

Effectiveness:

⇒ Increased short term risk during regrading of landfill mass. Contamination unknown.

⇒ Increased short term risk consolidation of soils/sediments.

⇒ Increased potential for infiltration through the cap due to increased retention time of surface water on the cap. The installation of a low permeability layer may address this issue.

⇒ Cover components are placed in tension as a result of settlement, resulting in potential increase in long term risk to cap integrity.

⇒ Increased O&M costs to monitor cap.

Implementability:

⇒ Implementation would require regulatory agency approval for design slopes below guidance.

⇒ Potential negative public perception of moving landfill waste which is potentially contaminated.

⇒ Contamination levels are unknown. Rads, metals and volatile organics are anticipated.

Cost:

⇒ Capital cost is $9,393,800. Costs are highly sensitive to H&S issues related to moving landfill waste and may increase significantly in response to monitoring and regulatory requirements.

⇒ Present Worth of O&M over 30 years is $2,774,400.

⇒ Total Present Worth cost is $12,168,200.

Environmental Impact:

⇒ Required fill volume is 75,576 CY. Minimizing fill volume decreases environmental impacts to borrow areas.

⇒ The overall footprint of the landfill is increased due to the proposed waste transfer operations.

Landfill Closure
Seep Collection
Project Team

Wednesday, January 18,1995
Small West Conference Room
1:00

AGENDA

Introductions (if necessary)

Options Analysis Outcome

- Description of methodology used during screening
- Presentation of preferred alternatives
- Open Discussion

Agency Meeting

- Present all alternatives? or one "preferred" alternative?

Updates on previous actions items/special projects

Assignment of new action items

Next Project Meeting will be held Wednesday, January 25th in the Interlocken Small West Conference Room at 10:00AM

1/19